

C L A I M S

1. A digital movie information recording medium
(10 in FIG. 1) comprising:

a data area (DA in FIG. 17) for storing file data
(e.g., RTR_MOV.VRO in FIG. 20) containing digital movie
information recorded in a predetermined recording unit;
and

a management area (DA21 in FIG. 17) for storing
navigation data (RTR.IFO or RTR_VMG in FIG. 20) for
managing information stored in said data area,

wherein said management area comprises:

a first storage field (e.g., C_PBI in FIG. 12;
M_VOBI in FIG. 24) for storing an erasion level flag
which sets a specific recording unit (e.g., lower cells
3 and 4 in FIG. 39; lower VOB3 and VOB4 in FIG. 49) in
said data area in a temporarily erased state.

2. A medium according to claim 1, further
comprising

a second storage field (C_PBI in FIG. 16; M_VOBI
in FIG. 24) for storing information (PGC_N, C_ID_N;
M_VOBI_GI/VOB_TY/TE) of a recording field (PGC) to
which the specific recording unit set with the erasion
level flag originally belongs,

wherein recording contents of said first and
second storage fields (C_PBI; M_VOBI) contain
information (PGC_N, C_ID_N in FIG. 16; trash PGC
information in PRM_TXTI in FIG. 33; M_VOBI_GI in

FIG. 24) required for recovering the specific recording unit (lower cells 3 and 4 in FIG. 39; lower VOB3 and VOB4 in FIG. 49) set in the temporarily erased state to a state before erasion.

5 3. A medium according to claim 1 or 2, wherein the specific recording unit (lower cells 3 and 4 in FIG. 39; lower VOB3 and VOB4 in FIG. 49) set in the temporarily erased state are allowed to be actually erased (step C10 in FIG. 40) on the basis of recording
10 contents of said first storage field (C_PBI in FIG. 12; M_VOBI in FIG. 24).

 4. A medium according to any one of claims 1, 2, and 3, wherein said management area includes trash box information (trash PGC) containing a trash box flag
15 (FIG. 15) which pertains to recording contents of said first and second storage fields (C_PBI; M_VOBI), and whether or not the specific recording unit set in the temporarily erased state is present is determined (steps C3 to C7 in FIG. 40) on the basis of contents of
20 the trash box flag.

 5. A recording method, which records information on a digital information recording medium (10) having a data area (DA) for storing file data (RTR_MOV.VRO) containing digital movie information in a predetermined
25 recording unit, and a management area (DA21) for storing navigation data (RTR.IFO or RTR_VMG) for managing information stored in the data area,

comprising the step of:

storing an erasion level flag which sets a specific recording unit (lower cells 3 and 4 in FIG. 39) in the data area in a temporarily erased state in a first storage field (C_PBI in FIG. 12; M_VOBI in FIG. 24) of the management area (step B21 in FIG. 37).

6. A method according to claim 5, further comprising the steps of

storing information (PGC_N, C_ID_N; M_VOBI_GI) of a recording field (PGC) to which the specific recording unit set with the erasion level flag originally belongs in a second storage field (C_PBI in FIG. 16; M_VOBI in FIG. 24) of the management area (step B22 in FIG. 37); and

recovering the specific recording unit (lower cells 3 and 4 in FIG. 39; lower VOB3 and VOB4 in FIG. 49) set in the temporarily erased state to a state before erasion on the basis of recording contents of the first and second storage fields (C_PBI; M_VOBI) (step C9 in FIG. 40).

7. A method according to claim 5 or 6, further comprising the step of actually erasing the specific recording unit (lower cells 3 and 4 in FIG. 39; lower VOB3 and VOB4 in FIG. 49) set in the temporarily erased state on the basis of recording contents of the first storage field (C_PBI in FIG. 12; M_VOBI in FIG. 24) (step C10 in FIG. 40).

8. A method according to any one of claims 5, 6, and 7, further comprising the step of creating trash box information (trash PGC) containing a trash box flag (FIG. 15) which pertains to recording contents of the first and second storage fields (C_PBI; M_VOBI) (step 5 B3 in FIG. 36).

9. A playback method, which extracts recording information from a digital information recording medium (10) having a data area (DA) for storing file data (RTR_MOV.VRO) containing digital movie information in a 10 predetermined recording unit, and a management area (DA21) for storing navigation data (RTR.IFO or RTR_VMG) for managing information stored in the data area, comprising the steps of:

15 extracting an erasion level flag which sets a specific recording unit (lower cells 3 and 4 in FIG. 39; lower VOB3 and VOB4 in FIG. 49) in the data area in a temporarily erased state from a predetermined field (C_PBI in FIG. 12; M_VOBI in FIG. 24) of the management area (step E5 in FIG. 44); and 20

skipping playback of the specific recording unit (lower cells 3 and 4 in FIG. 39; lower VOB3 and VOB4 in FIG. 49) set with the erasion level flag when the erasion level flag is set in the temporarily erased state (YES in step E10 in FIG. 44). 25

10. A method according to claim 9, further comprising:

when the predetermined field (C_PBI; M_VOBI) of the management area contains trash information (trash PGC) that pertains to the temporarily erased state of recording contents,

5 the display step (steps C3 to C7 in FIG. 40) of making a display that reveals contents of the specific recording unit in the temporarily erased state on the basis of contents of the trash box information (trash PGC).

10 11. A method according to claim 10, further comprising the step of presenting a trash box mark indicating that information set in the temporarily erased state is recorded on the medium before the display step is executed (step C2 in FIG. 40).

15 12. A recording method for recording an object comprised of a set of cells, and management information used for playing back the object on a recording medium which has a data area for storing the object and a management area for storing the management information, comprising the steps of:

20 setting (B5-B10 in FIG. 36) an appending range of erasion level information for designating with respect to one or more specific cells of the object whether playback is permitted or inhibited;

25 setting (B11-B20 in FIGS. 36-37) a divided cell, when a terminal portion of the erasion level information appending range does not match a cell unit of a

current cell, by dividing the current cell of the mismatch; and

changing (B21-B24 in FIG. 37) the management information for playing back the divided cell and current cell in accordance with contents of the cell division, and appending the erasion level information to the management information of the divided cell which belongs to the erasion level information appending range.

10 13. A recording apparatus for recording an object comprised of a set of cells, and management information used for playing back the object on a recording medium which has a data area for storing the object and a management area for storing the management information, comprising:

15 erasion level appending setting means for setting an appending range of erasion level information for designating with respect to one or more specific cells of the object whether playback is permitted or inhibited;

20 cell division means for setting a divided cell, when a terminal portion of the erasion level information appending range does not match a cell unit of a current cell, by dividing the current cell of the mismatch; and

25 new management information re-creating means for re-creating the management information for playing back

the divided cell and current cell in accordance with contents of the cell division, and appending the erasion level information to the management information of the divided cell which belongs to the erasion level information appending range.

14. An apparatus for playing back recording information from a recording medium which has a data area that records an object comprised of a set of cells, and a management area that records management information used for playing back the object, comprising:

cell unit display means for displaying a desired object in a predetermined cell unit on the basis of the management information played back from the medium;

erasion level appending range setting means for setting an appending range of erasion level information for designating whether playback is permitted or prohibited, in a unit not larger than the cell unit displayed by said cell unit display means; and

means for, when the erasion level information appending range set by said erasion level appending range setting means is determined and a current cell is consequently divided, displaying a cell unit of the object using a sequence of new divided cell units.

15. A recording method for recording an object (VOB) and management information used for playing back the object on a recording medium which has a data area for storing the object and a management area for

storing the management information, comprising the steps of:

5 setting (ST100-ST110 in FIG. 45) an appending range (upper illustration of VOB2, VOB3 in FIG. 49) of erasion level information (protect flag at ST134 in FIG. 46) for designating with respect to one or more specific objects (lower illustration of VOB3, VOB4 in FIG. 49) whether playback is permitted or inhibited;

10 setting (ST112-ST132 in FIGS. 45-46) a divided object, when a terminal portion of the erasion level information appending range (upper illustration of VOB2-VOB3 in FIG. 49) does not match a unit of a current object (upper VOB2 or upper VOB3 in FIG. 49), by dividing the current object (upper VOB2 or upper VOB3 in FIG. 49) of the mismatch; and

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 changing (ST130 in FIG. 46) the management information (VOBI) for playing back the divided object and current object in accordance with contents of the object division, and appending (ST134 in FIG. 46)

20 the erasion level information (protect flag) to the management information (VOBI) of the divided object (lower VOB3 or lower VOB4 in FIG. 49) which belongs to the erasion level information appending range (lower VOB2-VOB5 in FIG. 49).

25 16. An apparatus for recording and playing back video information from a recording medium, comprising:

 a temporary erased portion specifying portion (MPU

30 in FIG. 34; E3-E7 in FIG. 44) for specifying a temporarily erased portion (CELL3-CELL4 in the lower illustration of FIG. 12; or VOB3-VOB4 in the lower illustration of FIG. 49);

5 a temporary erased portion detecting portion (MPU 30 in FIG. 34; E10 in FIG. 44) for detecting only a unit of reproduction of the temporarily erased portion (CELL3-CELL4 in the lower illustration of FIG. 12; or VOB3-VOB4 in the lower illustration of FIG. 49) according to the specifying of said temporary erased
10 portion specifying portion;

 a temporary erased portion indicating portion (MPU 30 in FIG. 34; E11, E18 in FIG. 44) for indicating said unit of reproduction of the temporarily erased portion
15 (CELL3-CELL4 in the lower illustration of FIG. 12; or VOB3-VOB4 in the lower illustration of FIG. 49), thereby said apparatus being able to reproduce the indicated unit of reproduction.